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PATENT & TRADEMARK OFFICE

FIG. 1

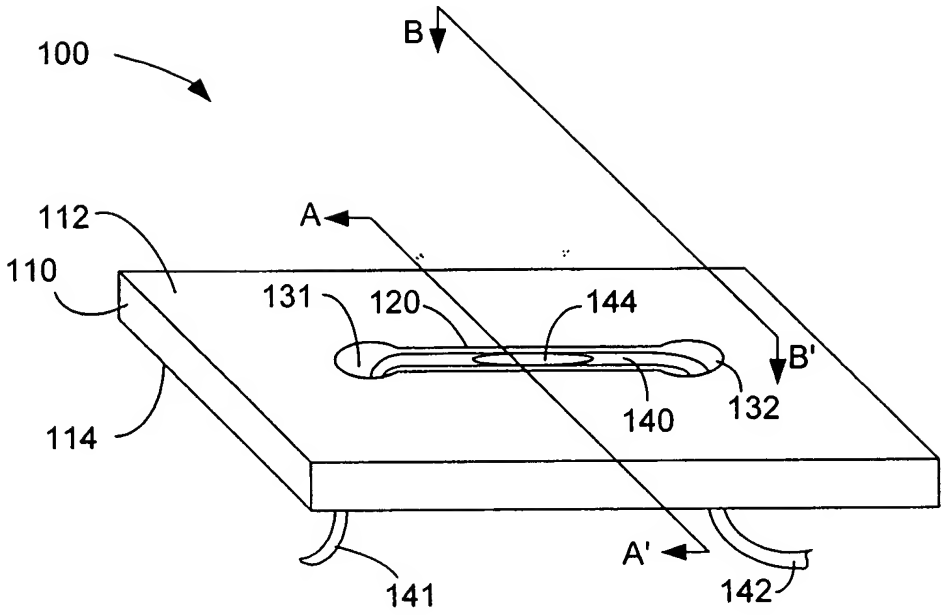


FIG. 2A

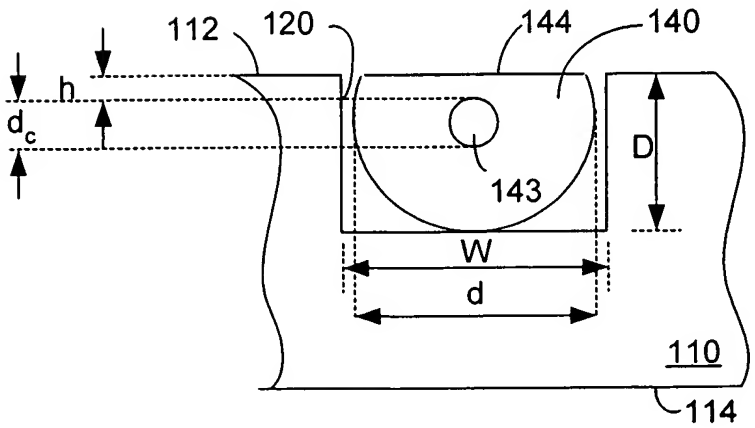


FIG. 2B

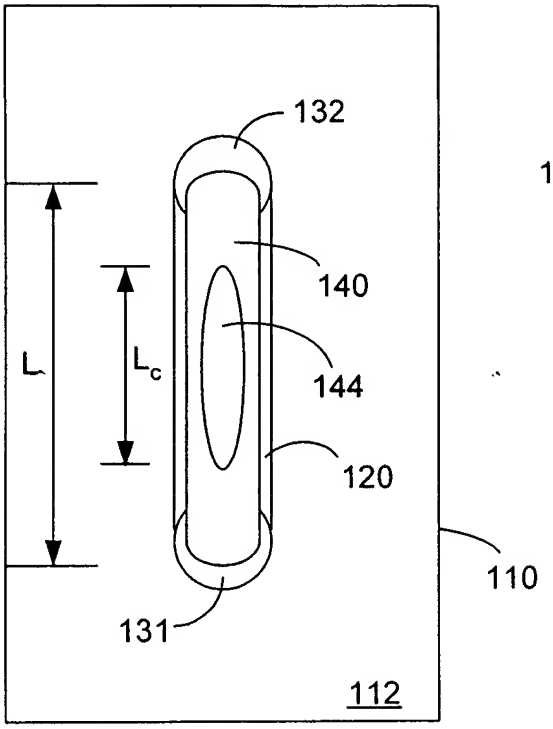


FIG. 2C

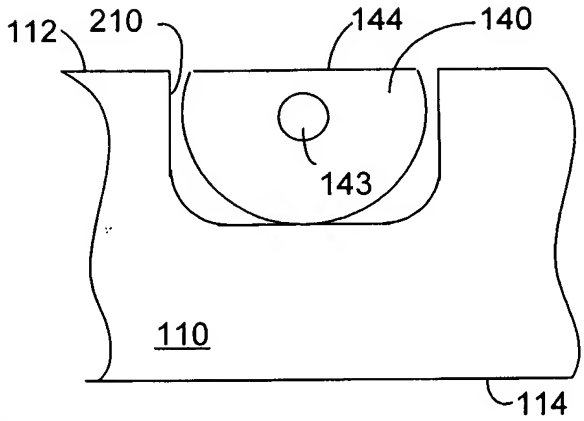


FIG. 2D

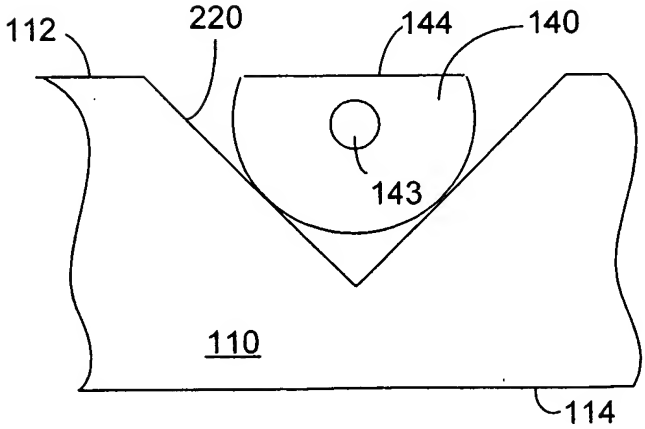


FIG. 2E

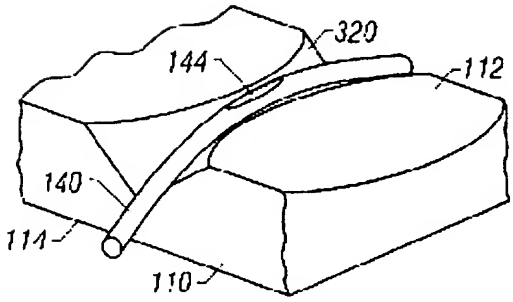


FIG. 3A

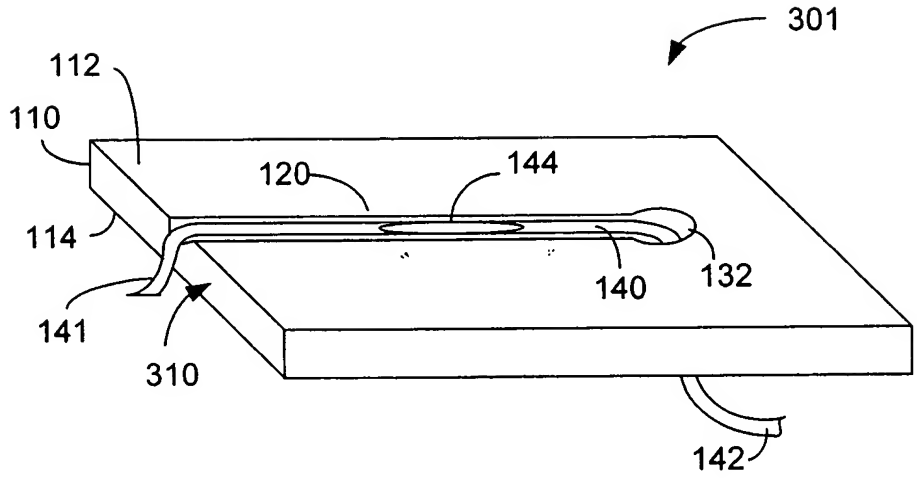

301
112
110
120
144
114
140
132
141
310
142

FIG. 3B

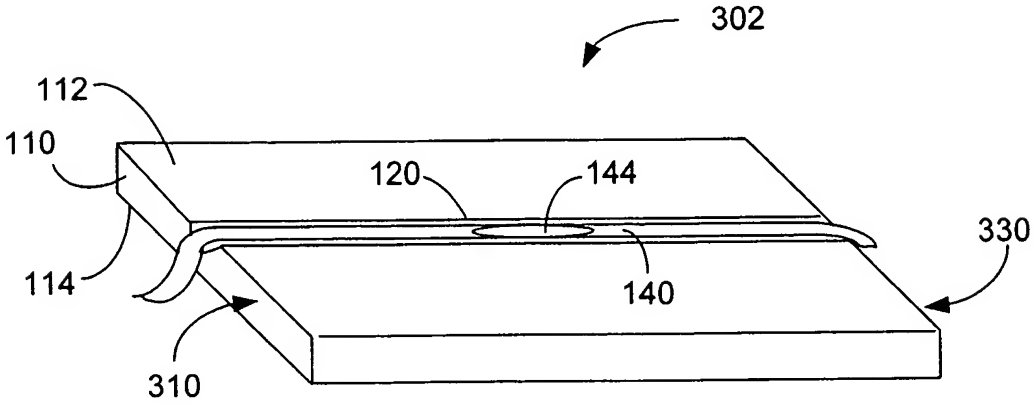

302
112
110
120
144
330
114
140
310

FIG. 4

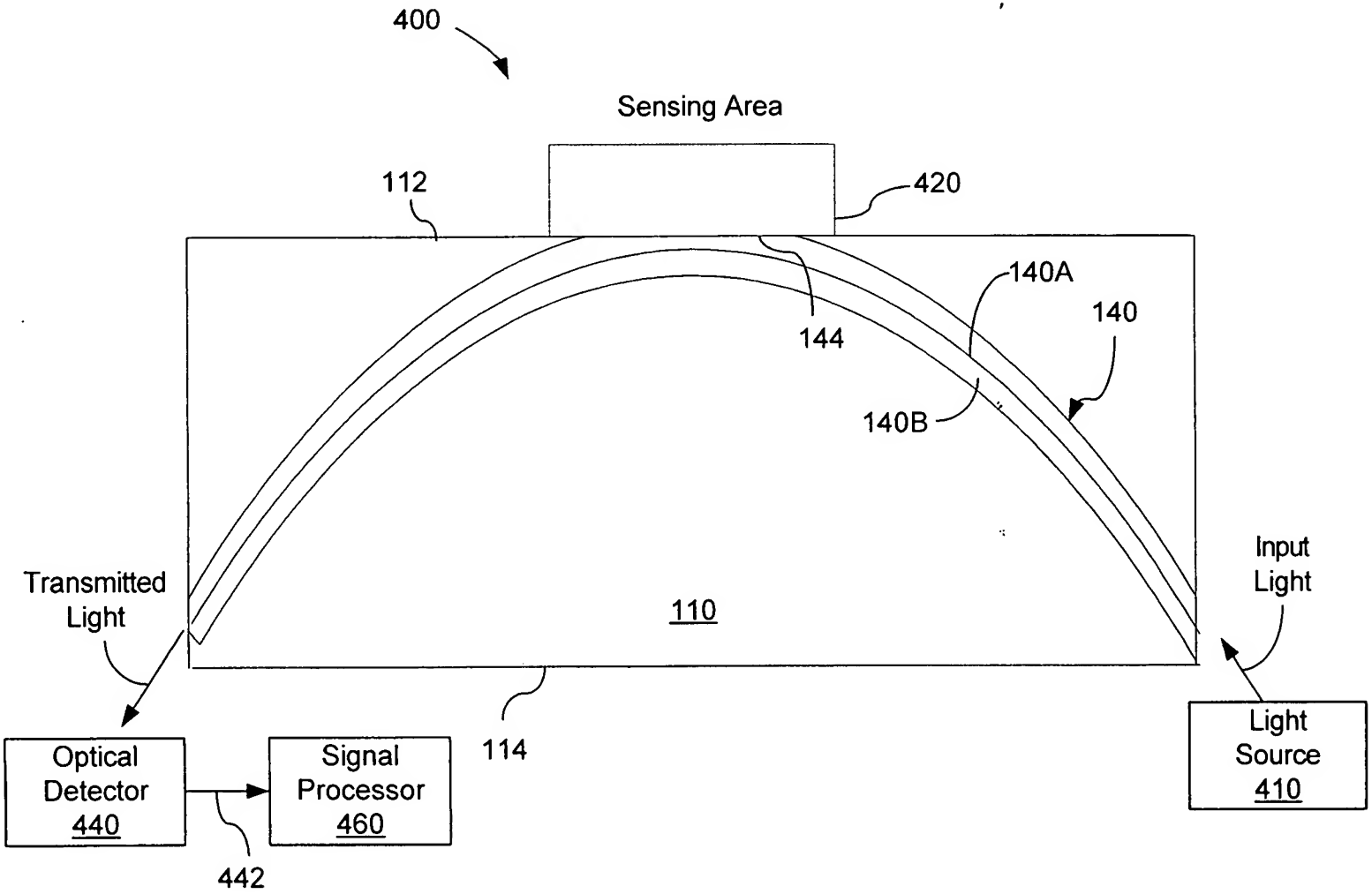

400
Sensing Area
112
420
140A
140
144
140B
Transmitted Light
110
Input Light
114
Optical Detector 440
Signal Processor 460
442
Light Source 410

FIG. 5

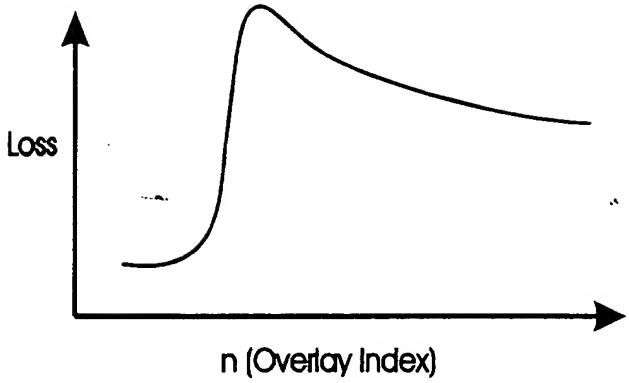


FIG. 6

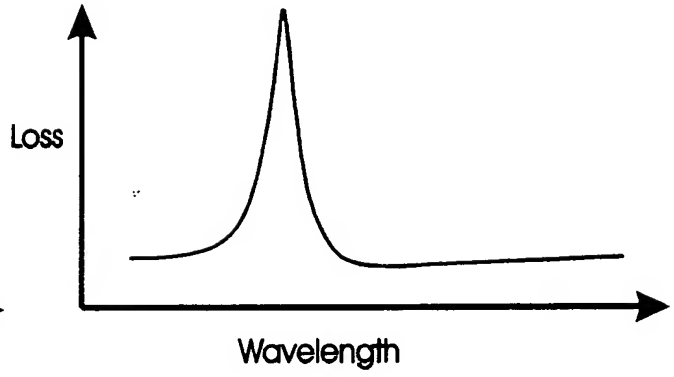


FIG. 7A

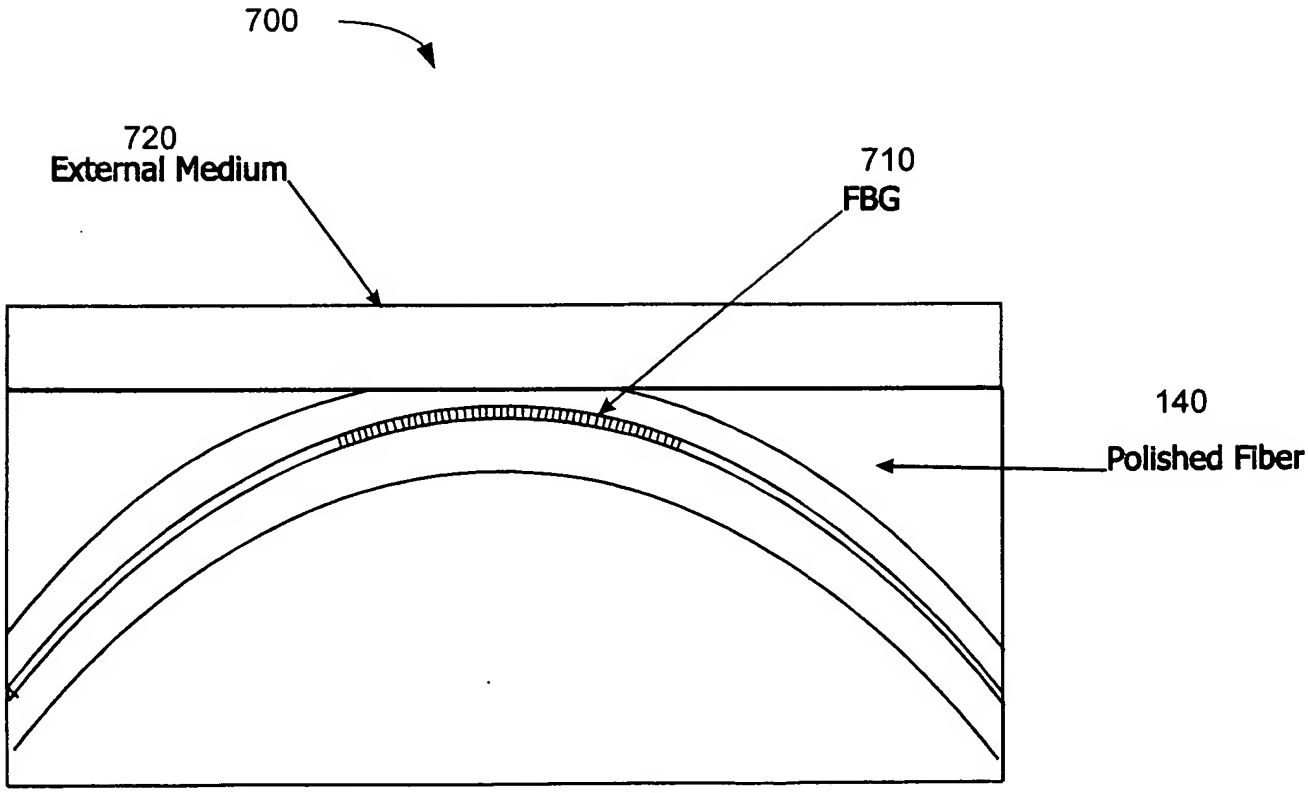
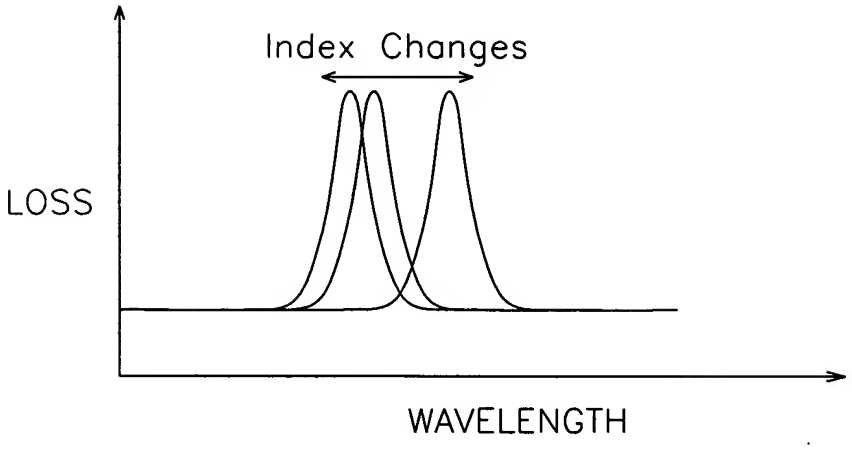


Figure 7B



800

Figure 8A

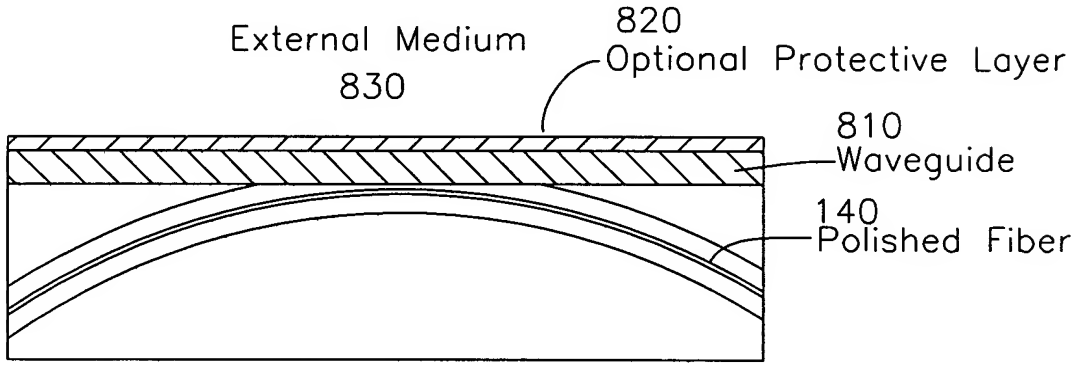


Figure 8B

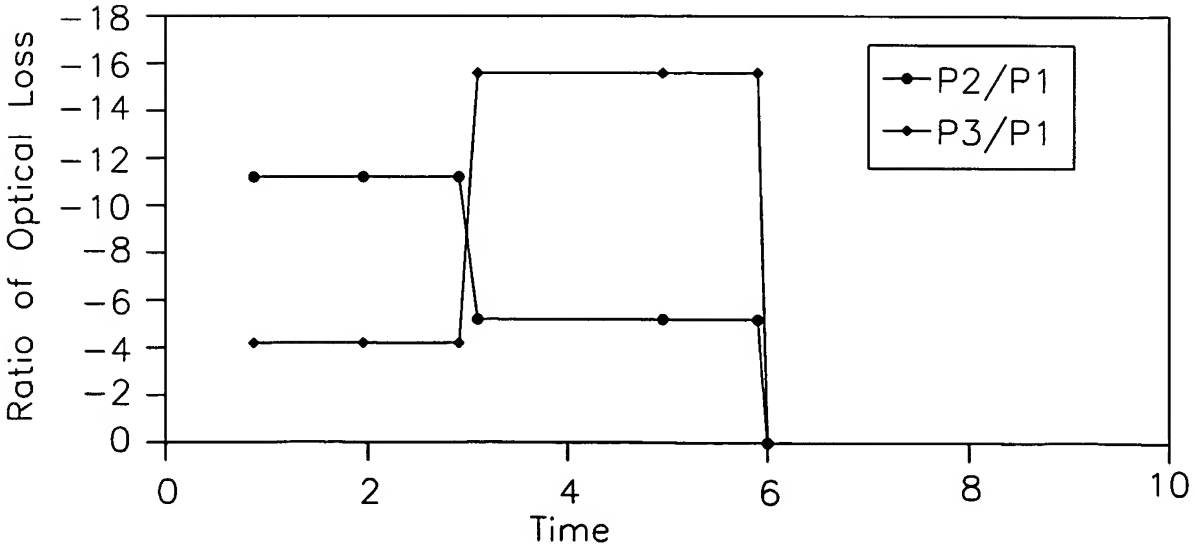


Figure 8C

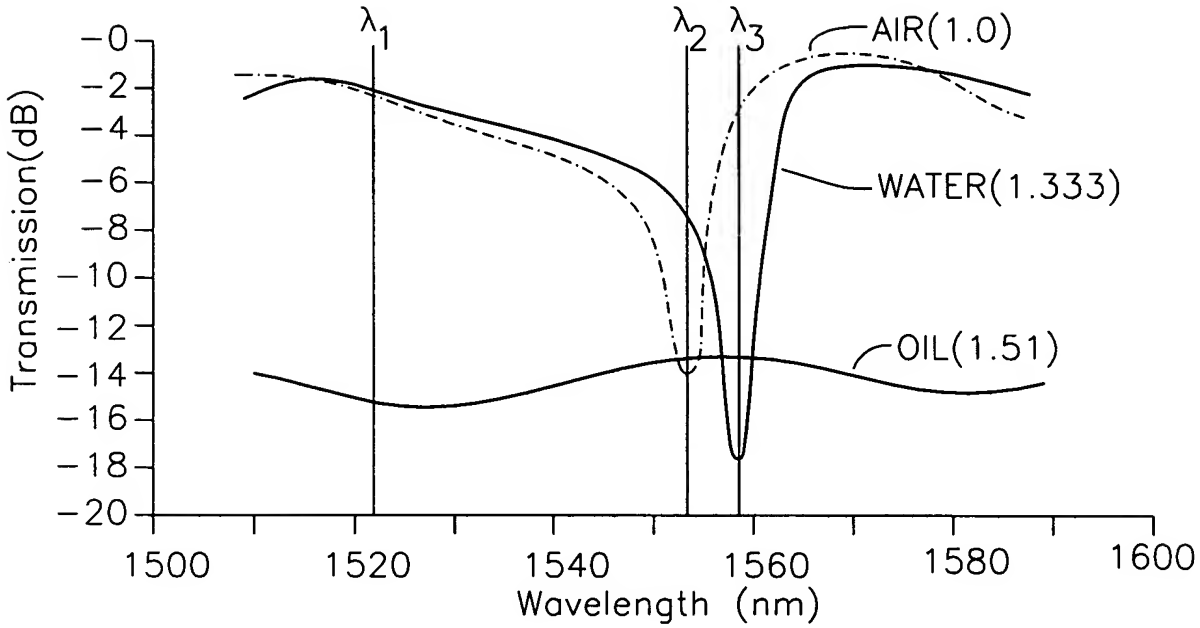
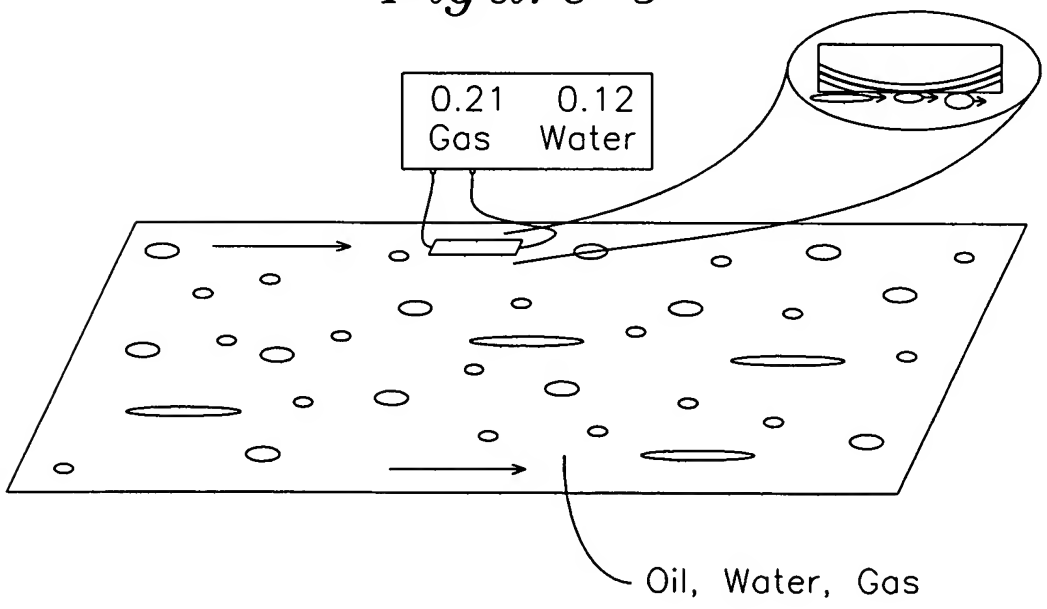


Figure 9



1000

Figure 10A

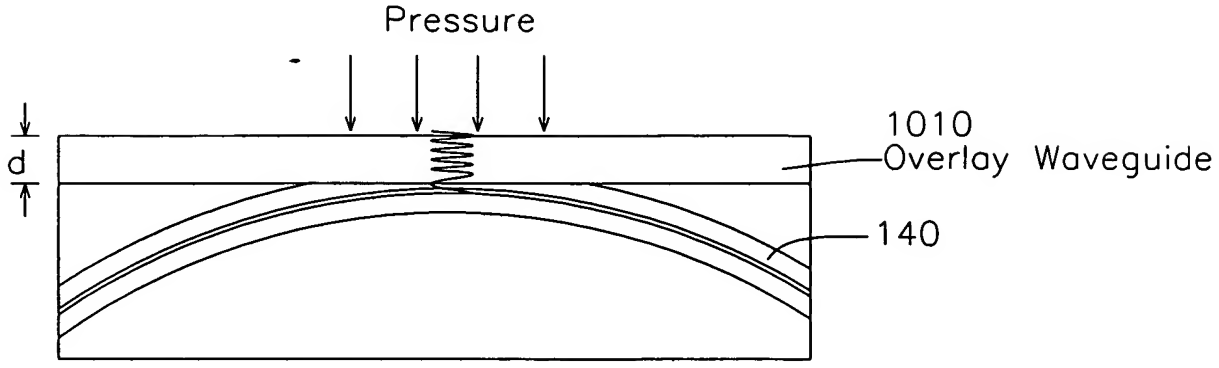
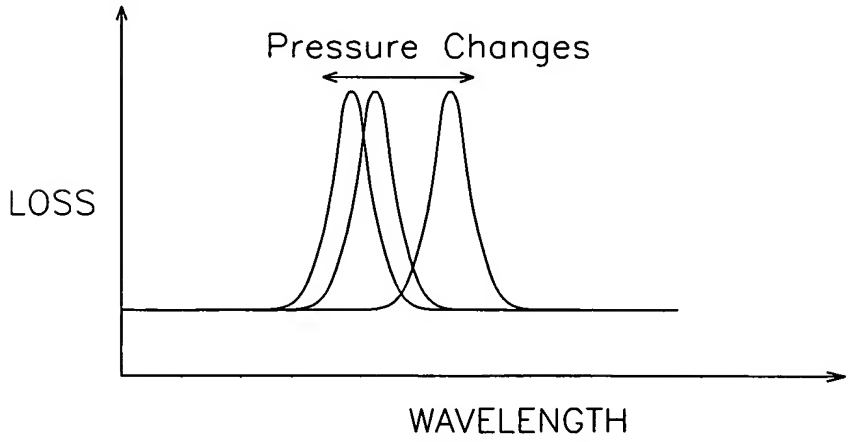


Figure 10B



1100 *Figure 11*

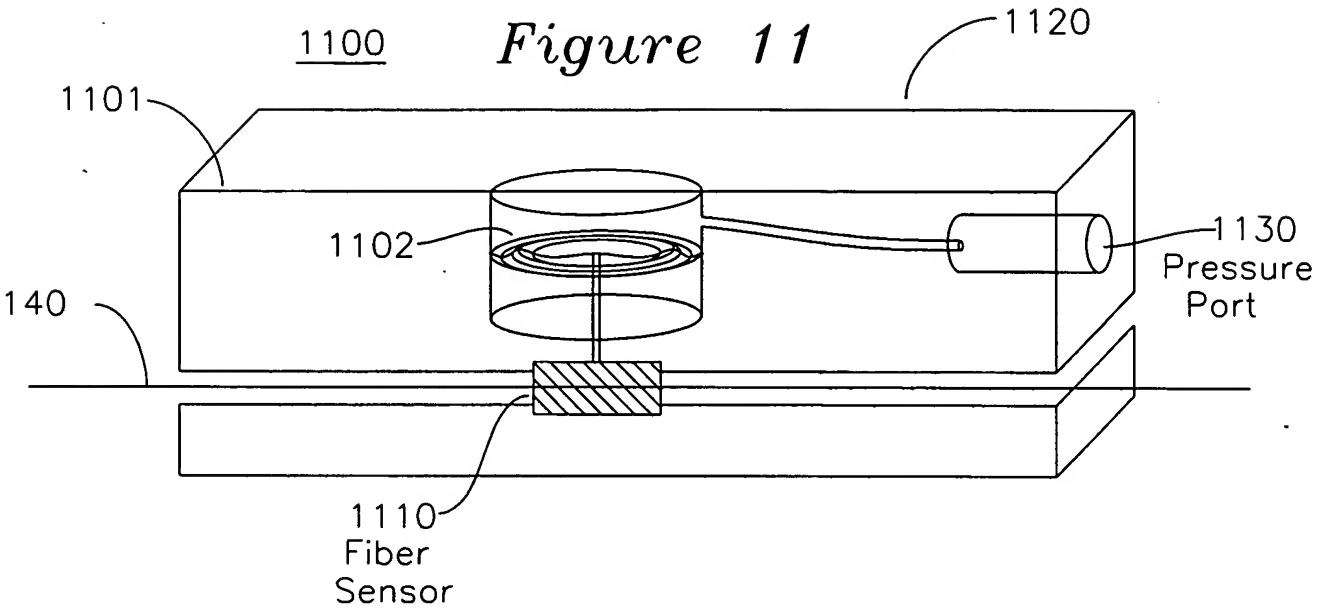
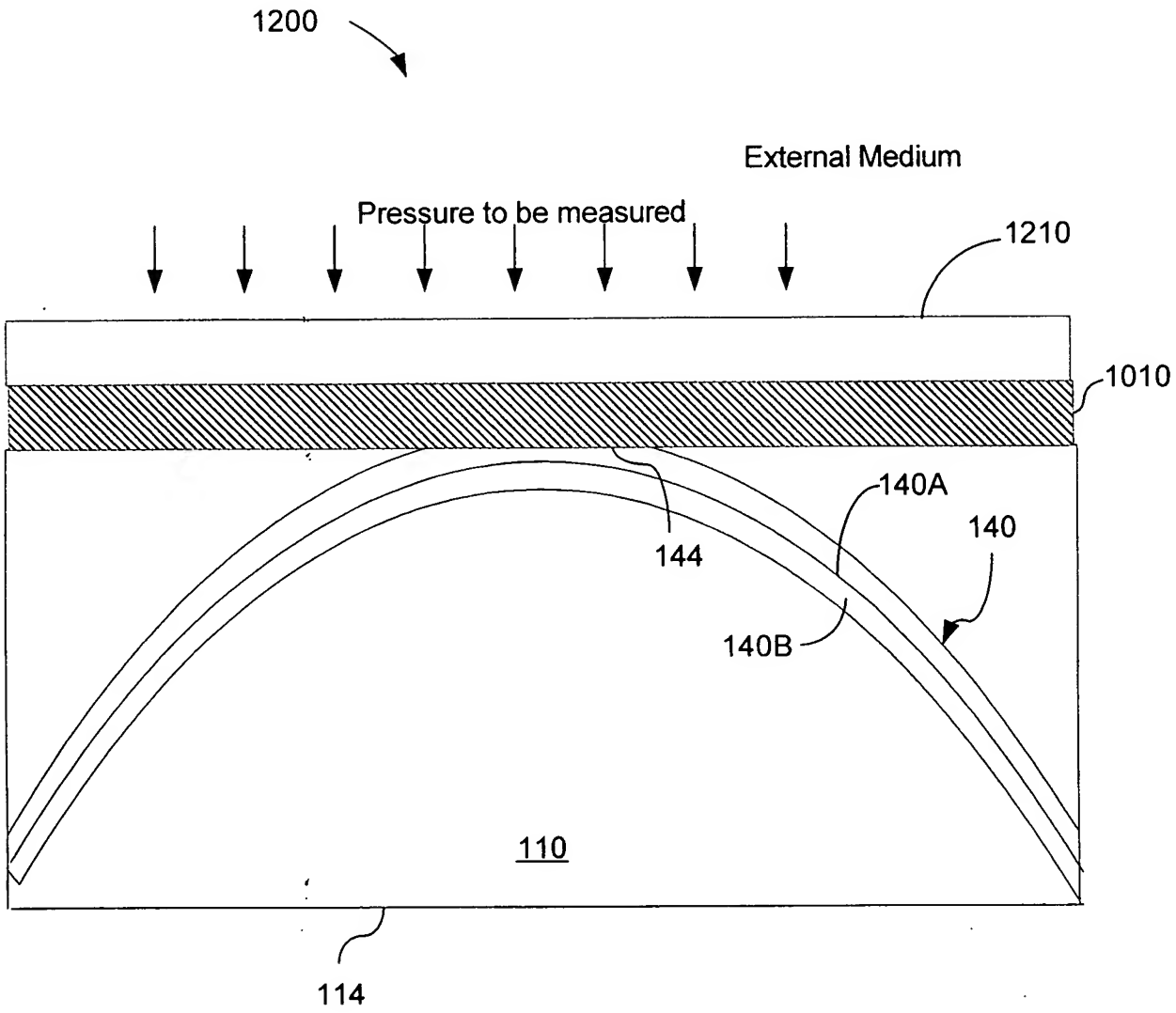


FIG. 12


1200
External Medium
Pressure to be measured
1210
1010
140A
140
144
140B
110
114

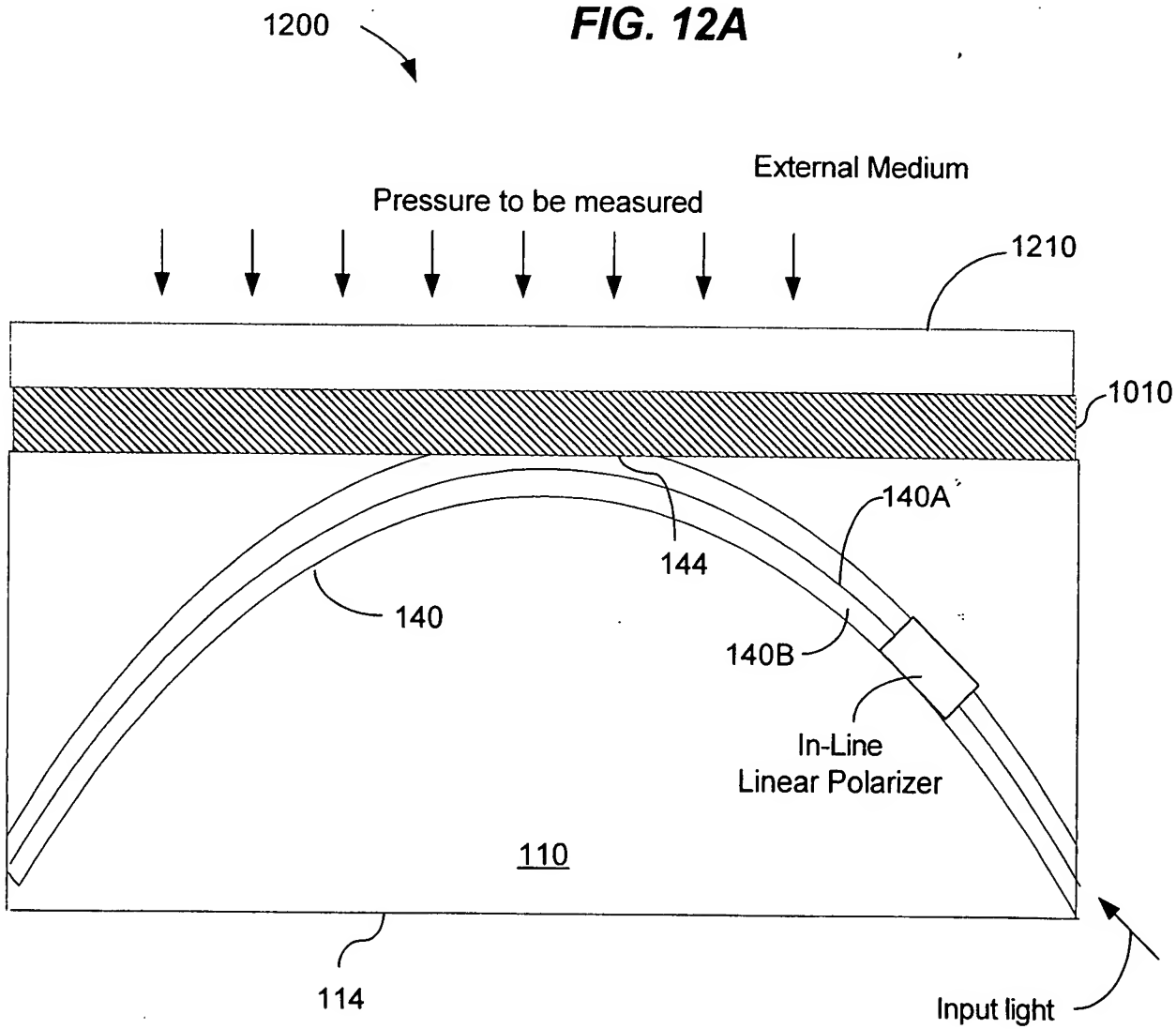

1200
External Medium
Pressure to be measured
1210
1010
140A
144
140
140B
In-Line
Linear Polarizer
110
114
Input light

FIG. 12A

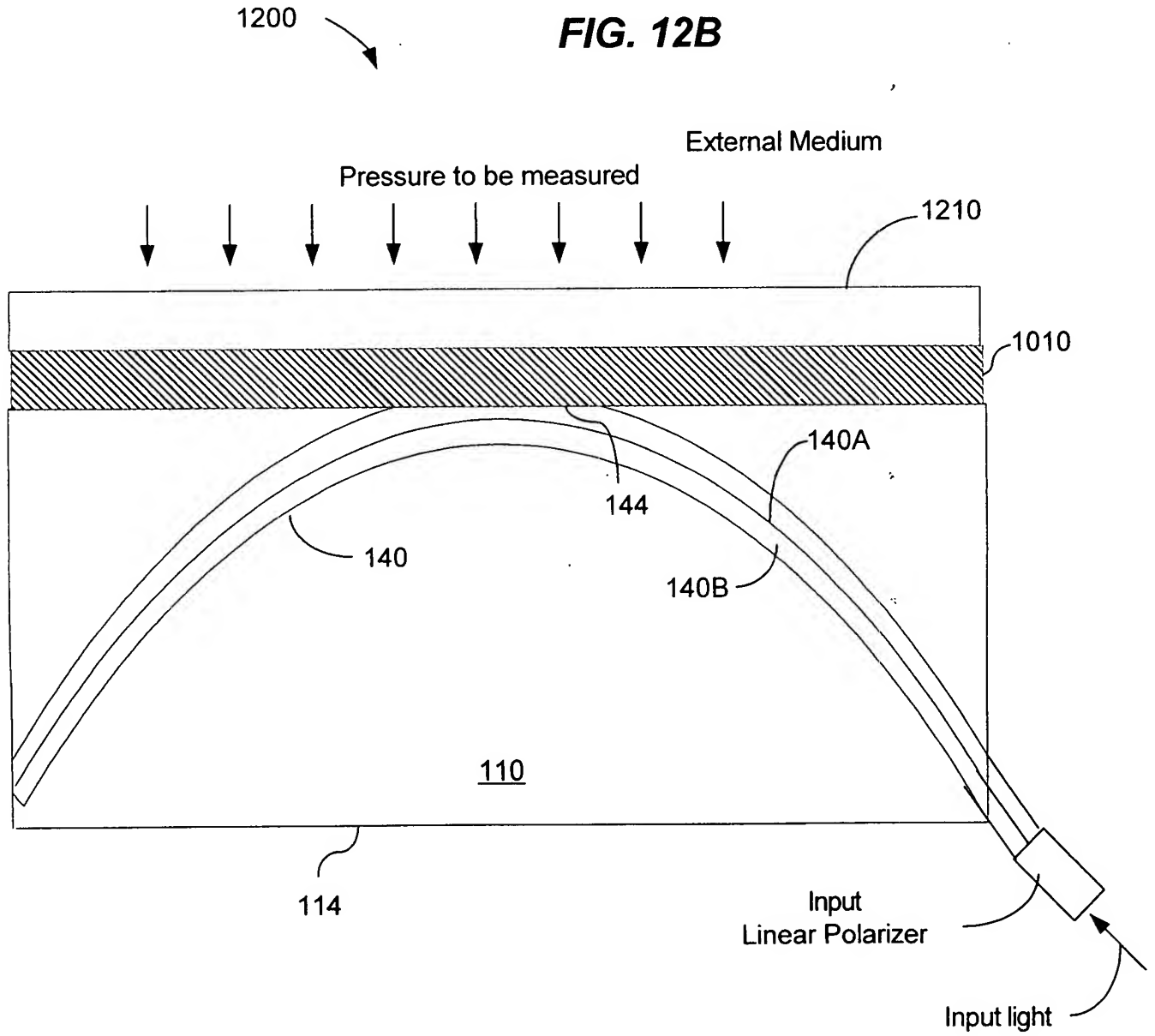

1200
External Medium
Pressure to be measured
1210
1010
140A
144
140
140B
110
114
Input
Linear Polarizer
Input light

FIG. 12B

Figure 13A

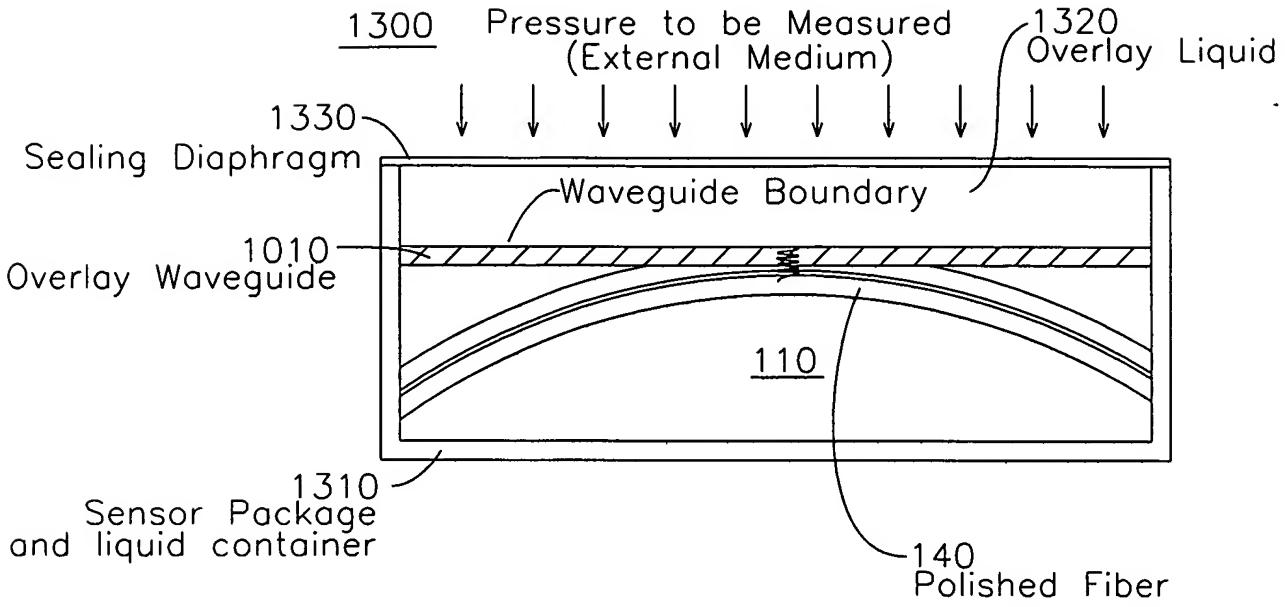
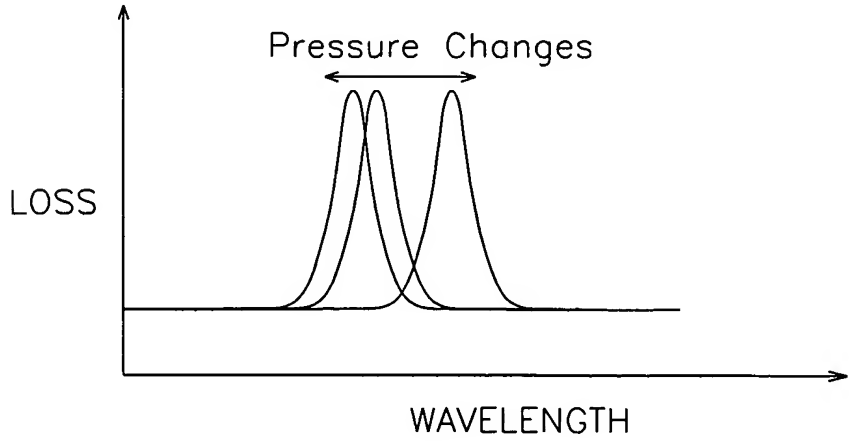


Figure 13B



1400

Figure 14A

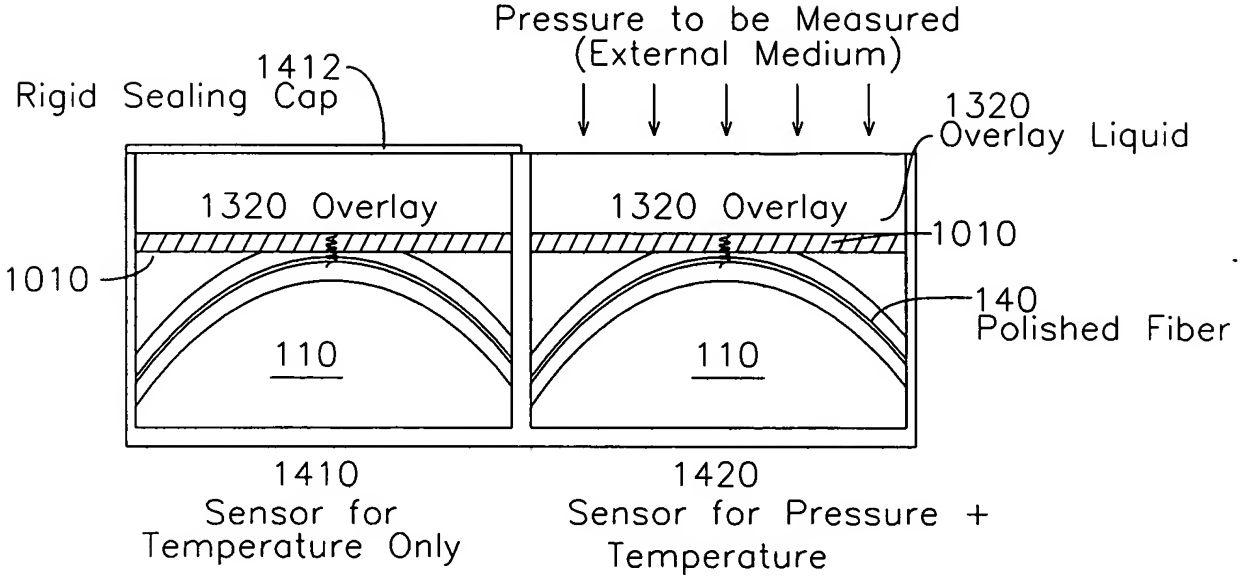


Figure 14B

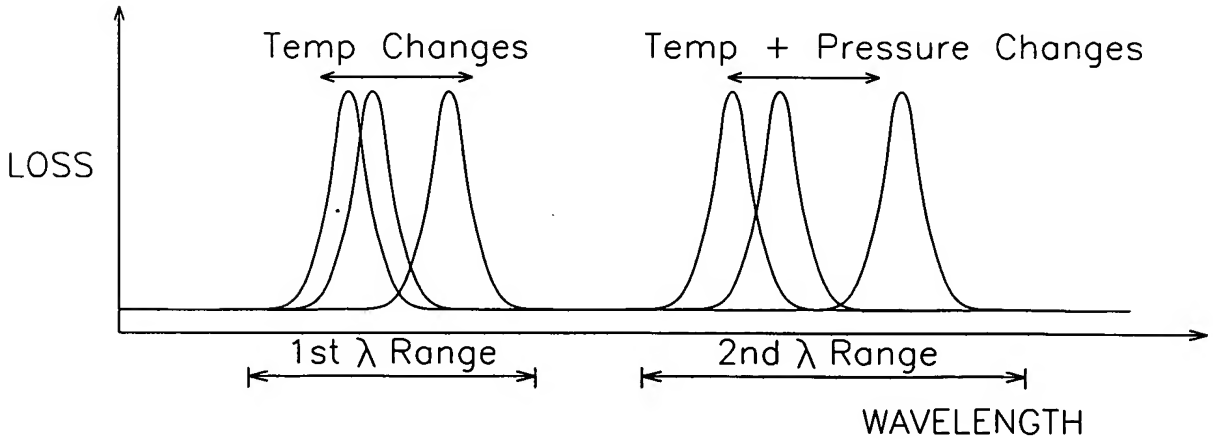


FIG. 15A

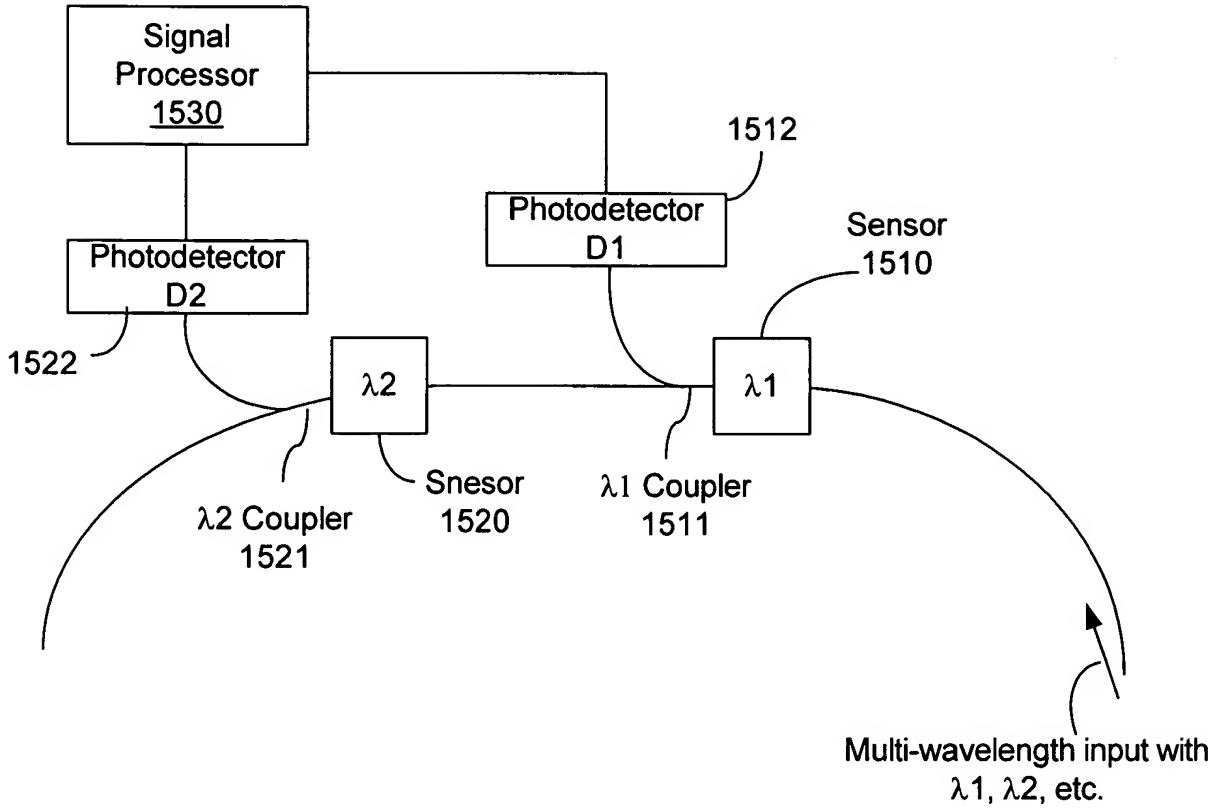


FIG. 15B

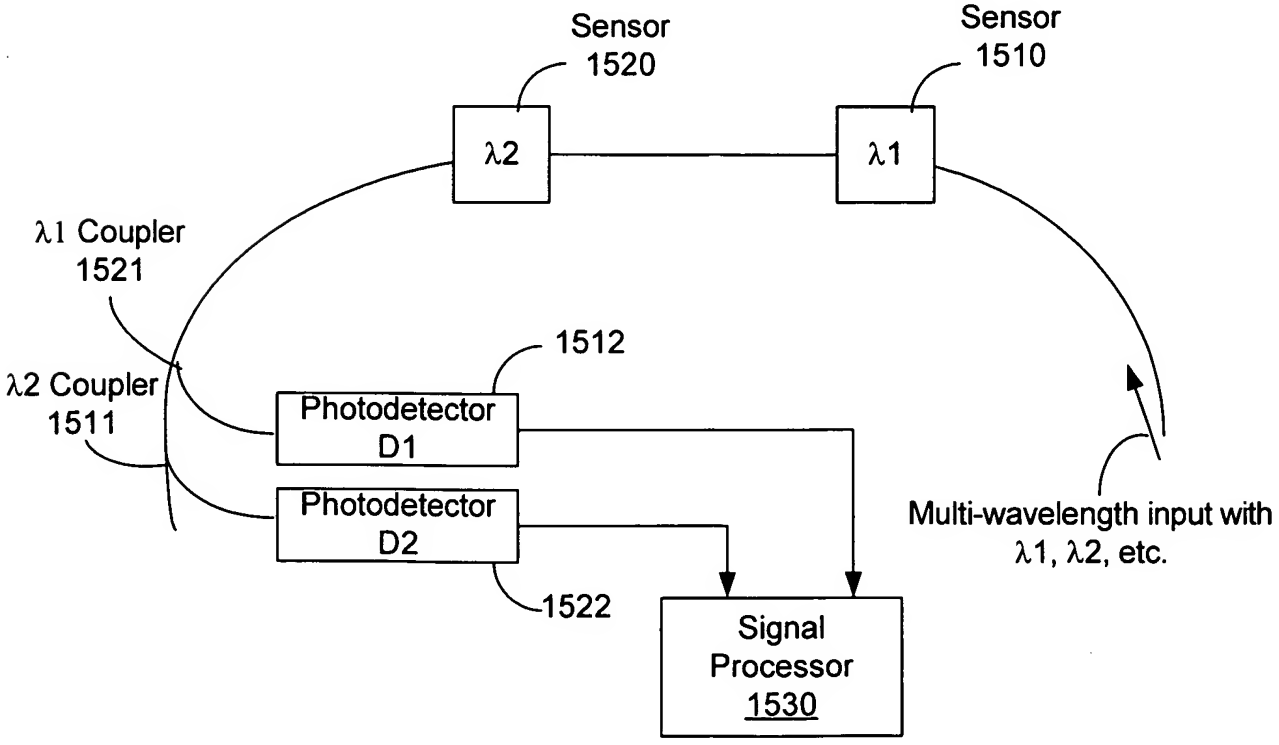


FIG. 16

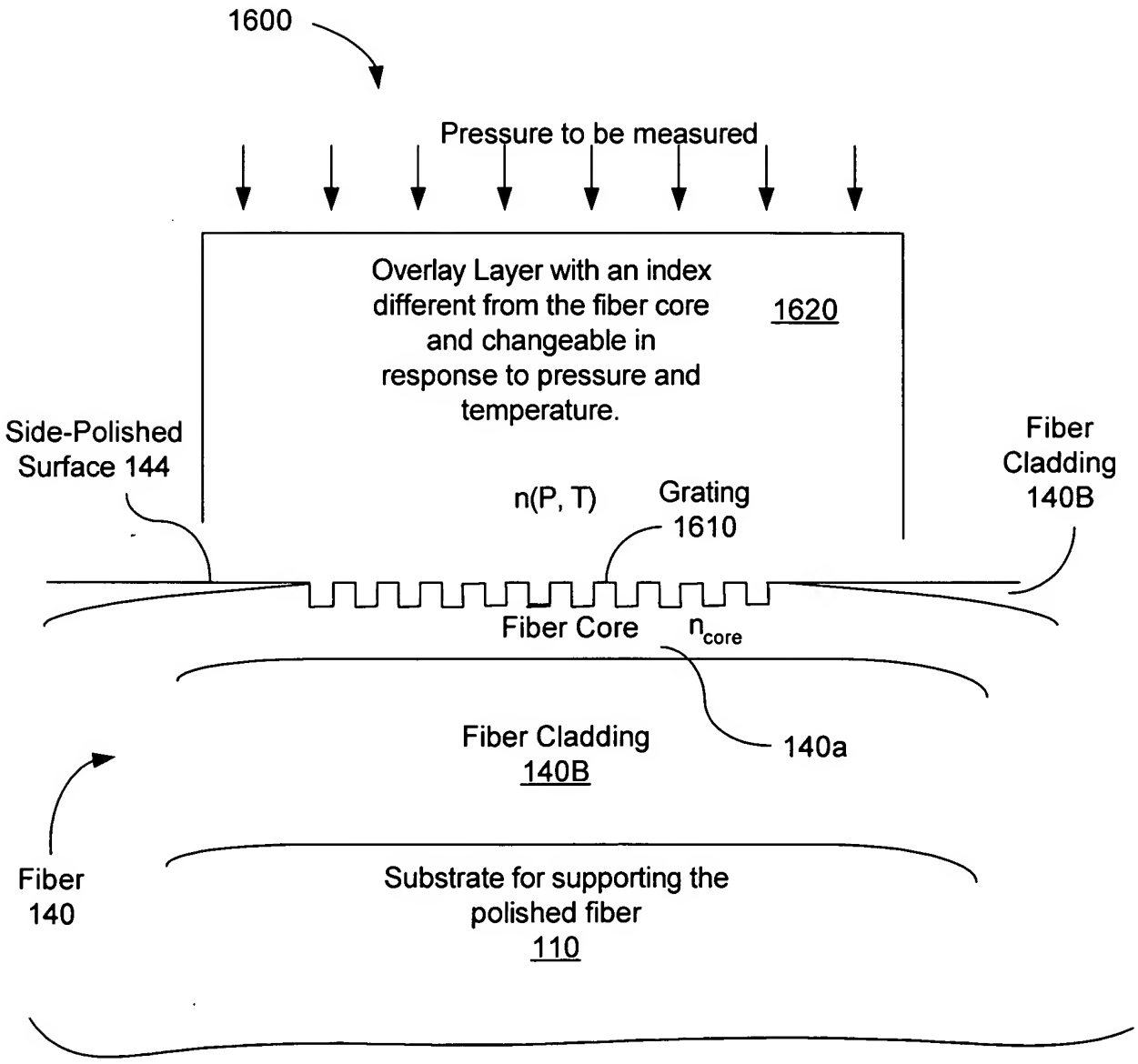

1600
Pressure to be measured
Overlay Layer with an index different from the fiber core and changeable in response to pressure and temperature.
1620
Side-Polished Surface 144
n(P, T)
Grating 1610
Fiber Cladding 140B
Fiber Core
n_{core}
Fiber Cladding 140B
140a
Fiber 140
Substrate for supporting the polished fiber 110

FIG. 17

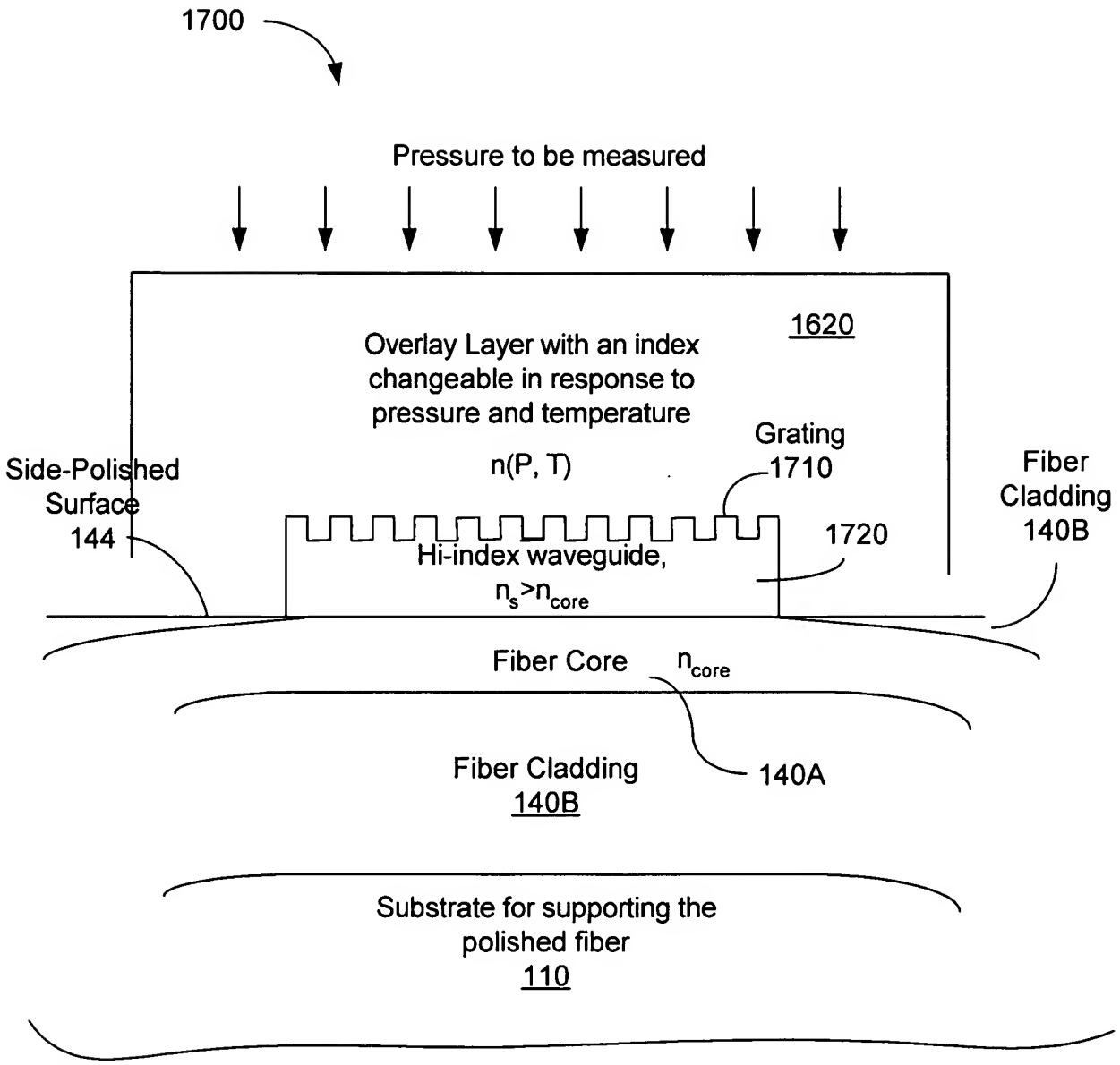

1700
Pressure to be measured
1620
Overlay Layer with an index changeable in response to pressure and temperature
n(P, T)
Grating
1710
Side-Polished Surface
144
Fiber Cladding
140B
1720
Hi-index waveguide,
$n_s > n_{core}$
Fiber Core
n_{core}
140A
Fiber Cladding
140B
Substrate for supporting the polished fiber
110

Figure 18A

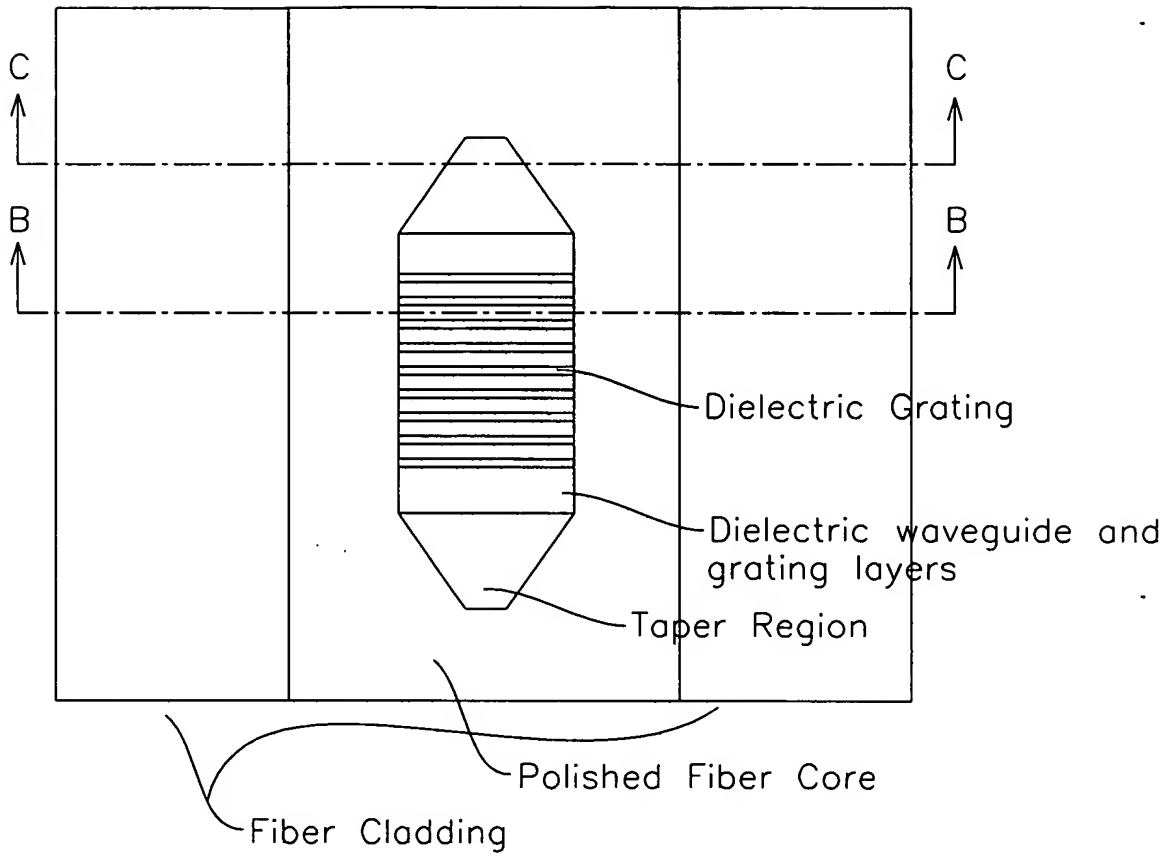


Figure 18B

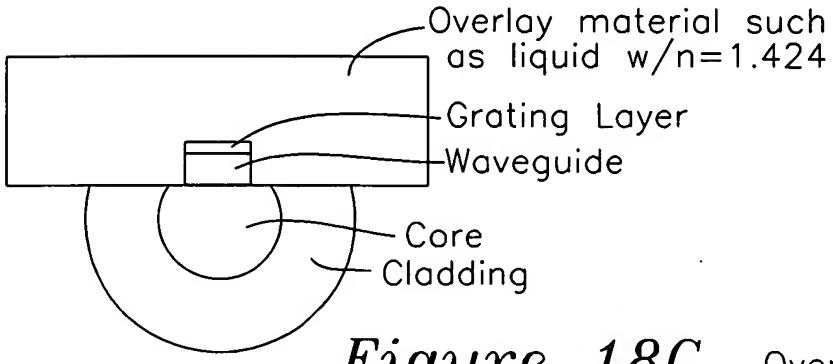


Figure 18C

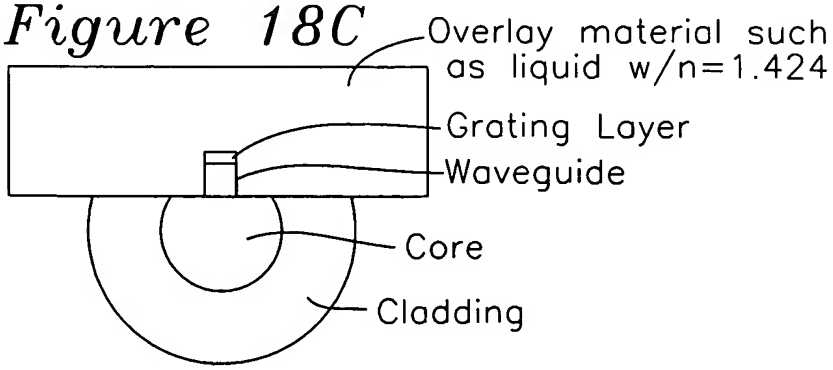


Figure 19

Computed Transverse Mode Profile (m=0, n_{eff}=1.455242, 2.067e−9)

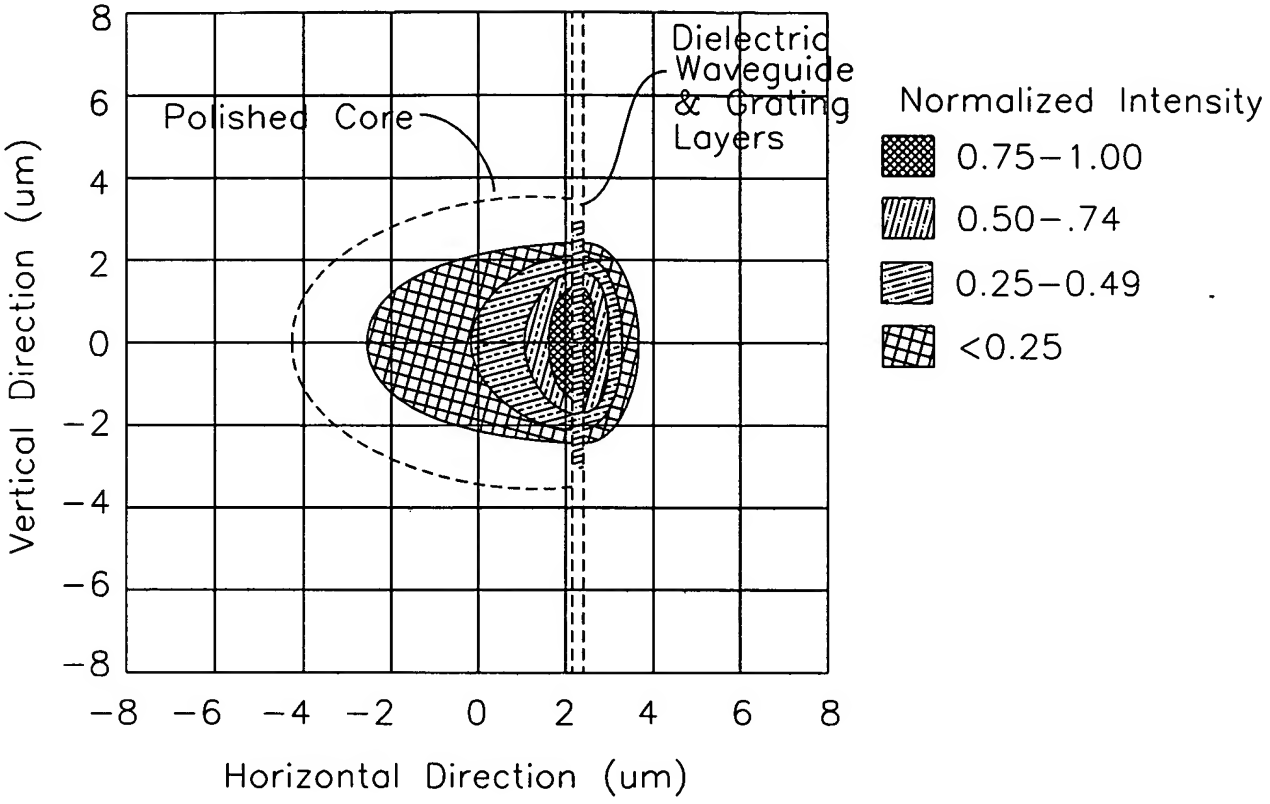
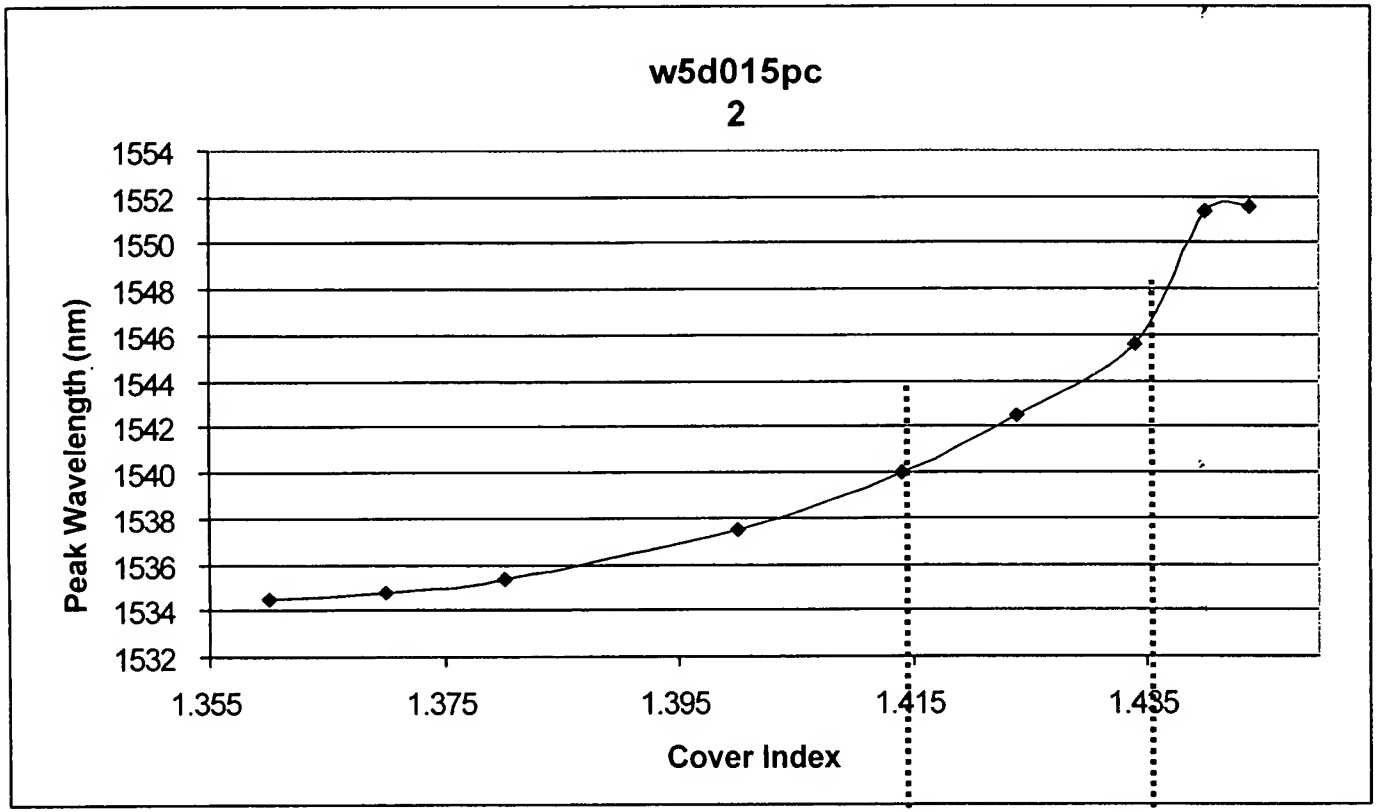


FIG. 20



Change of cover index from 1.415 to 1.435 can result in a shift of reflection peak from 1540 to 1546nm. The 1/10000 of the shift can be easily detected by many commercial wavelength meter.

FIG. 21

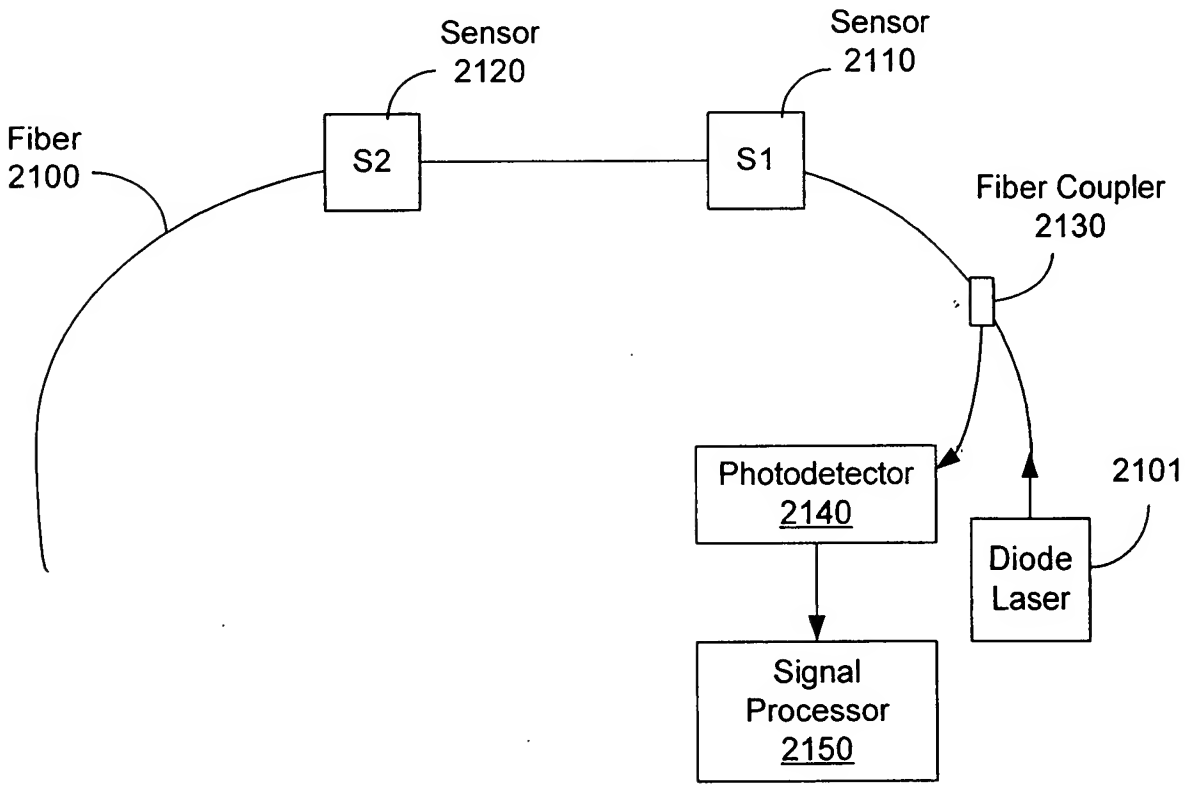

Sensor
2120
Sensor
2110
Fiber
2100
S2
S1
Fiber Coupler
2130
Photodetector
2140
2101
Diode
Laser
Signal
Processor
2150

Figure 22

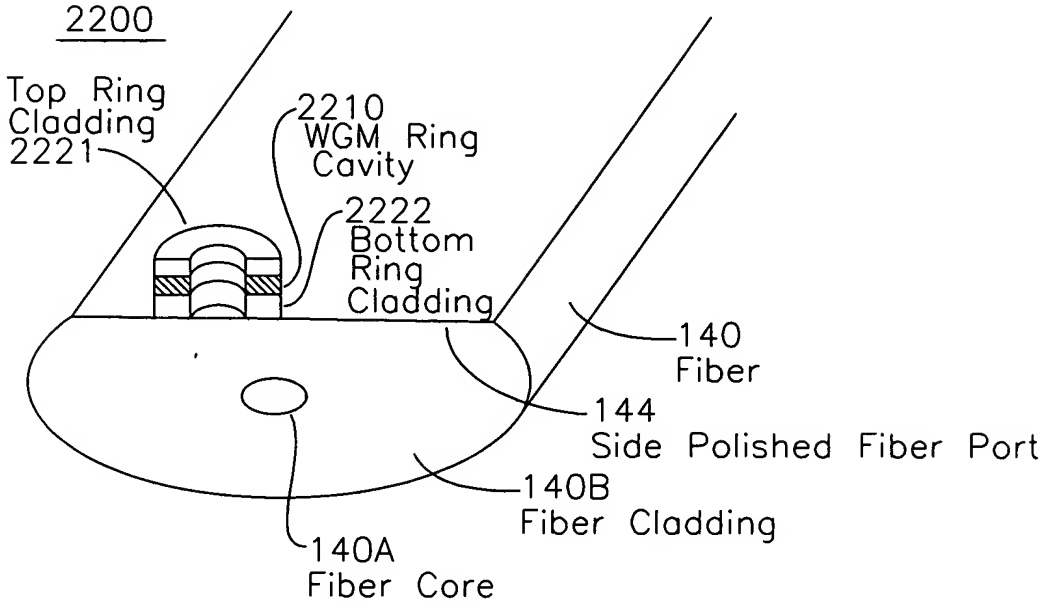


Figure 23

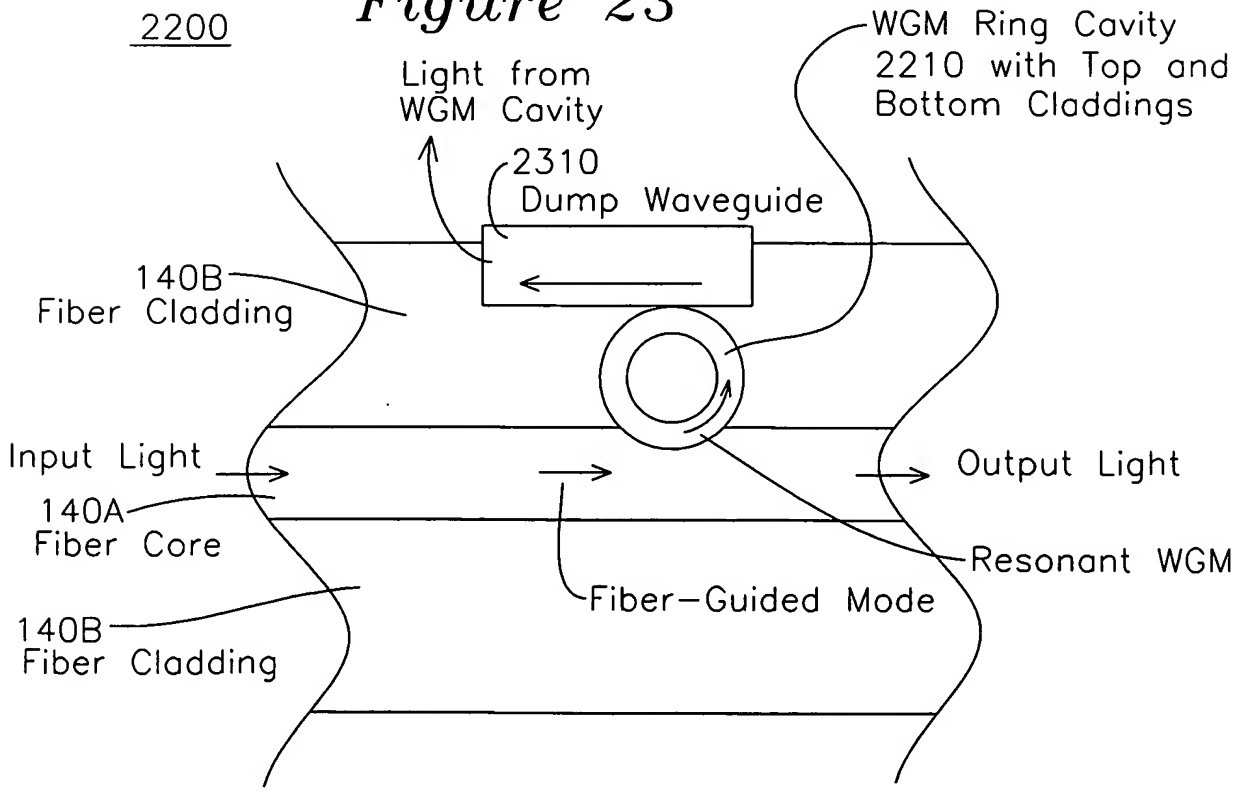
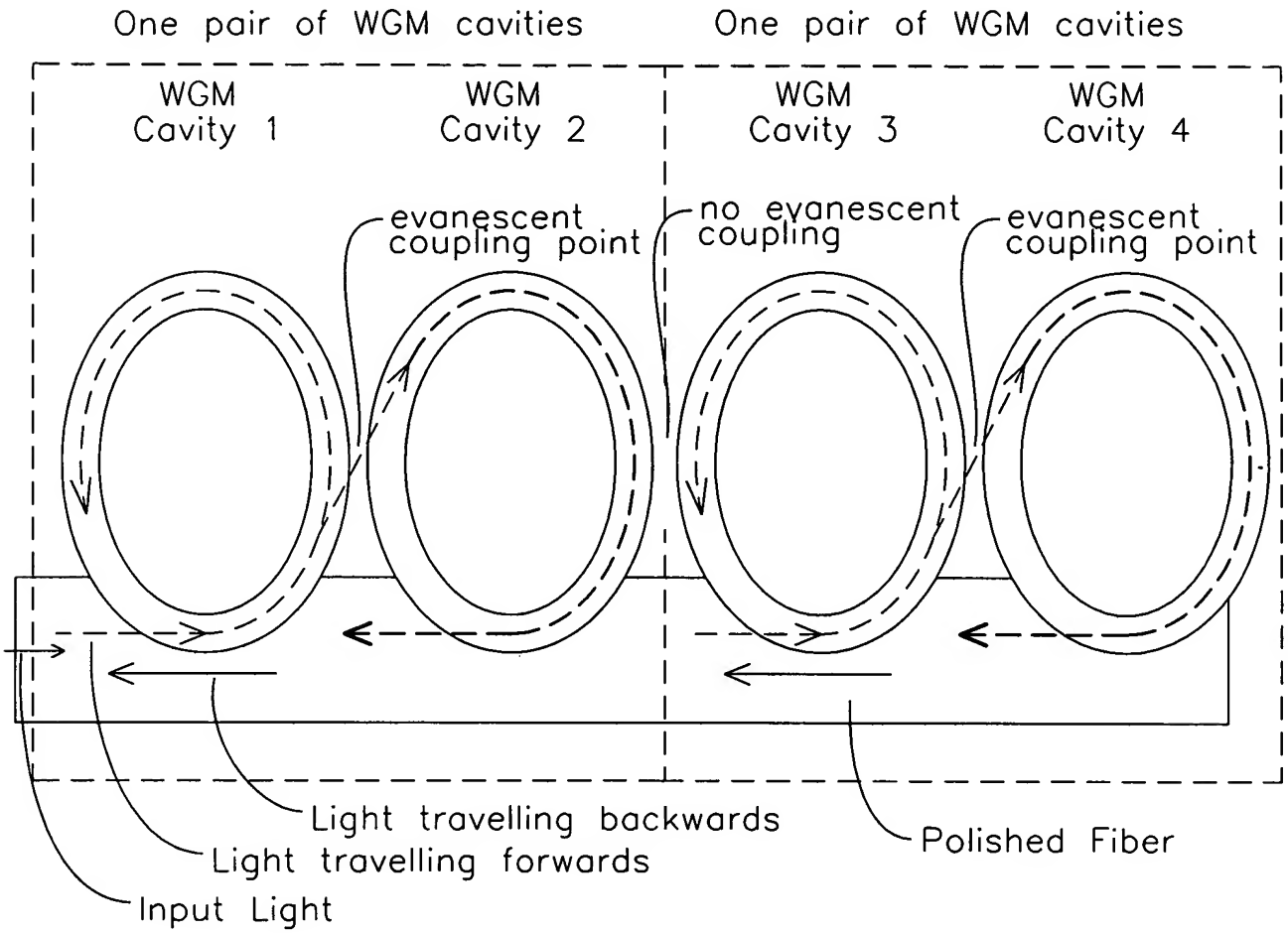


Figure 24

Microresonator arrays such as rings or disks

2400

Top View